

REMARKS

Examiner Vinh is to be thanked for careful review and examination of applicant's invention.

Favorable reconsideration of this application in light of the above amendment and the following remarks is respectfully requested.

Claims 1-20 are pending in this application. Claims 11, 19 and 20 have been amended. No claims have been allowed. No claims have been cancelled

Claim Rejections - 35 U. S. C. §112

1. The Examiner has rejected claim 11 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 11 is pointed out as having insufficient antecedent basis for limitation "the second conductor material".

In response to this rejection, applicant has amended Claim 11 to provide clarity and sufficient antecedent basis for the limitations cited. Claims 19 and 20 have also been amended for clarity. In light of the foregoing response, applicant respectfully requests that the Examiner's rejection of Claim 11 under 35 U. S. C §112 be withdrawn.

Claim Rejections – 35 U. S. C. § 103(a)

3. The Examiner has rejected claims 1-7 and 9-11 under 35 U. S. C. §103(a) as being unpatentable over Zhao et al. (US 6,100,184; hereinafter Zhao) in view of Wetzel et al. (US 5,920,790; hereinafter Wetzel). Applicant acknowledges in general the teachings of Zhao in view of Wetzel as cited by the Examiner.

In response, applicant asserts that the teachings of Zhao and Wetzel do not read on applicant's invention as claimed and disclosed in the instant application . The Examiner has stated {p. 3, lines 14-15) that “Zhao differs from the instant claimed invention as per Claim 1 by using a lower layer 13 (silicon oxide) as an etch stop layer instead of a composite etch stop layer”. This, applicant asserts, is a clear statement of a basic difference between Zhao's single layer and applicant's two-layer etch stop layer. The Examiner then cites Wetzel as claiming a composite etch stop layer. However, a reading of the citation in Wetzel clearly reveals: (1) Wetzel is discussing related art and not his own invention; (2) the reference by Wetzel to the related art is to a single- layer etch stop layer as the associated Fig. 9 (160) clearly shows. The meaning of “composite” as employed by Wetzel is to a composite mixture of two dielectric materials in a single etch stop layer(160), and not to two dielectric layers, (Wetzel, col. 1, lines.35-40), as claimed by Examiner. On the other hand, applicant just as clearly is referring to two separate sub-sub-layers to form a composite etch stop layer in applicant's disclosed and claimed invention (p. 9, lines 5-7).

Since each and every limitation of applicant's invention as disclosed and claimed in applicant's base Claim 1 and applicant's dependent Claims 2-7 and 9-11, which carry all the limitations of applicant's base Claim 1, are neither claimed nor disclosed singly or in combination by Zhao or Wetzel, applicant asserts that applicant's Claims 1-7 and 9-11 may not properly be rejected under 35 U.S.C 103(a) over Zhao in view of Wetzel .

In light of the foregoing response, applicant respectfully requests that the Examiner's rejection of applicant's Claims 1-7, 9-10 and amended Claim 11 as being unpatentable under 35 U.S.C. §103(a) over Zhao in view of Wetzel be withdrawn.

4. The Examiner has rejected Claim 8 under 35 U. S. C. §103(a) as being unpatentable over Zhao in view of Wetzel and further in view of Sliwa et al (US 5,192,715; hereinafter Sliwa).

Applicant acknowledges in general the teaching of Zhao in view of Wetzel and further in view of Sliwa as cited by the Examiner.

In response, applicant asserts that neither Zhao, Wetzel nor Sliwa singly or in combination teach each and every limitation of applicant's disclosed and claimed invention as disclosed and claimed in applicant's base Claim 1. As cited in Section 3 above, none of the cited references teach a composite layer formed of two separate sub-layers employed as an etch stop layer, which is a key feature and limitation of applicant's invention. Therefore, the teaching of Zhao, Wetzel and Sliwa may not properly be used as a basis for rejection of applicant's dependent Claim 8, which carries all the limitations of applicant's base Claim 1.

In light of the foregoing response, applicant respectfully requests that the Examiner's rejection under 35 U.S.C. § 103(a) of applicant's Claim 8 be withdrawn.

5. The Examiner has rejected Claims 12-20 under 35 U.S.C. §103(a) as being unpatentable over Zhao in view of Wetzel and further in view of Cronin et al. (US 5,759,911; hereinafter Cronin).

Applicant acknowledges in general the teachings of Zhao in view of Wetzel and further in view of Cronin.

In response, applicant asserts that neither Zhao, Wetzel nor Cronin singly or in combination teach each and every limitation of applicant's invention as claimed in applicant's base Claim 12, dependent Claims 13-18 and amended Claims 19-20. As cited in Sections 3 and 4 above, none of the cited references teach a composite etch stop layer of two separate sub-layers, which is a basic limitation of applicant's invention as disclosed and claimed in applicant's base Claim 12, dependent Claims 13-18 and amended dependent Claims 19-20. Therefore applicant asserts that they may not be properly cited under 35 U.S.C § 103(a) as a basis for rejection of applicant's Claims 12-20.

In light of the foregoing response, applicant respectfully requests that the Examiner's rejection under 35 U.S.C. §103(a) of applicant's Claims 12-18 and amended Claims 19-20 over Zhao in view of Wetzel and further in view of Cronin be withdrawn.

Other Considerations

Applicant acknowledges additional prior art of record employed in rejecting applicant's invention, including: Zhao et al. (U.S. Patent No. 6,100,184); Wetzel et al. (U.S. Patent No. 5,920,790); Cronin et al. (U.S. Patent No. 5,759,911); and Sliwa et al. (U.S. Patent No. 5,192,715).

No fee is due as a result of this amendment.

SUMMARY

Applicant's invention as claimed within Claims 1-10, amended Claim 11, Claims 12-18 and amended Claims 19-20 is directed towards a damascene interconnection method within a microelectronics fabrication which employs a composite etch stop layer. The composite etch stop layer is composed of two separate sub-layers which permit fabrication of the damascene interconnection with inhibited and attenuated damage to the underlying conductor stud layer. Absent from the prior art of record employed in rejecting applicant's claims to applicant's invention is a disclosure of each and every pertinent limitation within applicant's invention as disclosed and claimed within Claims 1-10, amended Claim 11, Claims 12-18 and amended Claims 19-20

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CONCLUSION

On the basis of the above amendments and remarks, reconsideration of this application, and its early allowance, are respectfully requested.

Any inquiries relating to this or earlier communications pertaining to this application may be directed to the undersigned attorney at 914-452-5863 or Mr. George Saile, Esq. (Reg. No. 19,572) at 914-452-5863, at the Examiner's convenience.

Respectfully submitted,

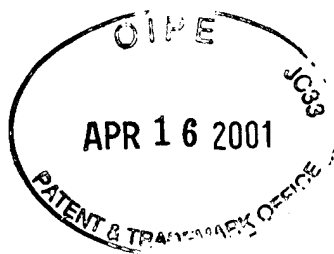
A handwritten signature in black ink, appearing to read 'SBA', is positioned above the printed name of the signatory.

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims

Claims 11, 19 and 20 have been amended as follows:

11. (amended) The method of Claim 4 [1] wherein the said [second] conductor material is copper metal.

19. (amended) The method of Claim 14 [12] wherein the conductor material employed to fill the interconnection trench is copper metal.

20. (amended) The method of Claim 14 [12] wherein the barrier metal layer is formed employing tantalum nitride (TaN).